

Technical Information

Radio

FM-LW-MW-SW 6-Band
Portable Radio

RF-2800LBS RF-2900LBS

Subject: Frequency Counter Circuit

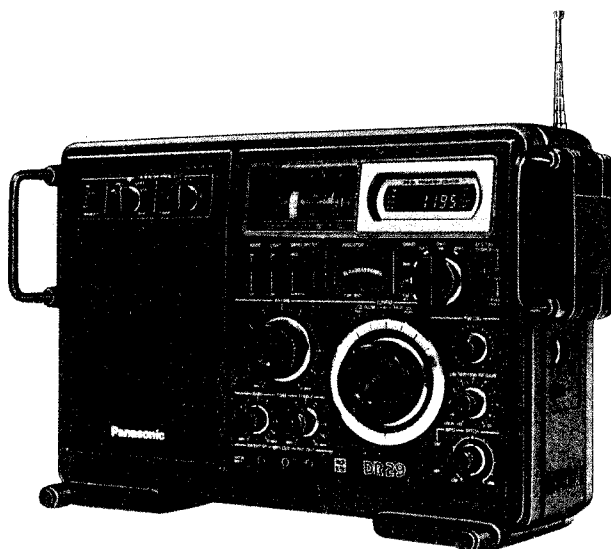


Table of Contents

I. Outline	page 2
II. Block Diagram	page 3
III. Preset Selector Circuit	page 4
A. FM Band	page 5
B. AM Band	page 5
IV. Counter Signal Circuit	page 5
V. Signal Selector Circuit	page 6
A. FM Band	page 6
B. AM Band	page 6

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RF-2800/RF-2900 Frequency Counter Circuit

I. Outline:

The RF-2800/RF-2900 displays the frequency of the received broadcast by counting the frequency of the local oscillator and scaling accordingly. Figure 1 is a block diagram for the receiver. The following relationships exist between the reception frequency (f_s), the local oscillator frequency (f_o), the intermediate frequency (f_i) and the display frequency (f_d).

(A) $f_s \pm f_i = f_o \dots (1)$

(B) $f_d = f_s = f_o \pm f_i \dots (2)$

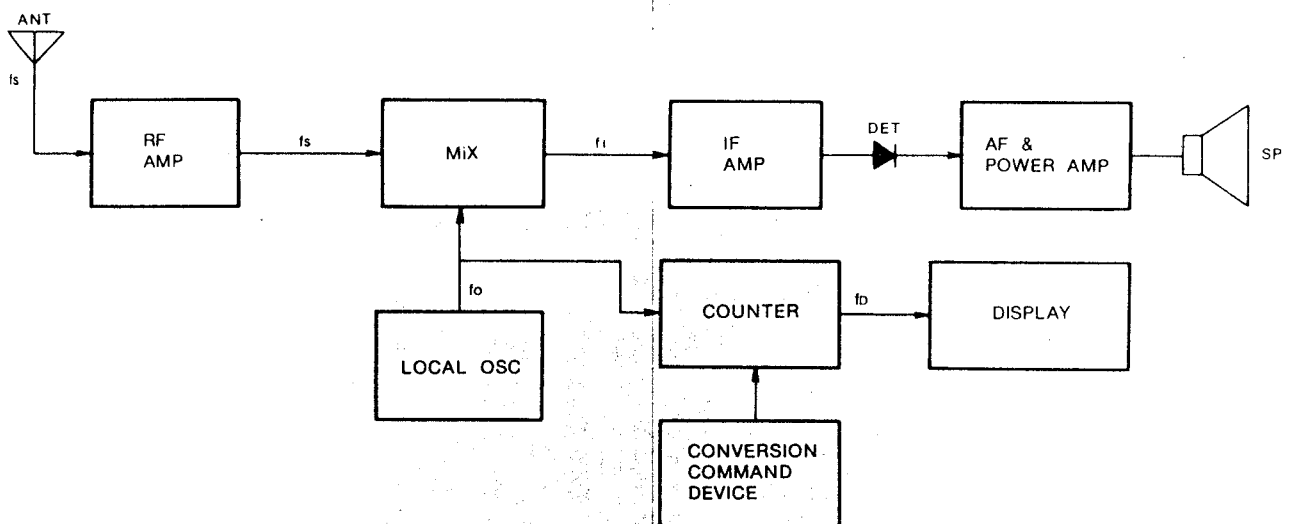


Fig. 1

With reference to figure 1, for example

Reception frequency (f_s) = 10 MHz

Intermediate frequency (f_i) = 455 kHz

Under these conditions, the local oscillator frequency (f_o) must be, according to formula (1), 10.455 MHz (called "upper local oscillation") or 9.545 MHz (called "lower local oscillation"). Thus, if 10.455 MHz is used as the local oscillator signal:

Display frequency (f_d) = 10.455 (f_o) - 0.455 (f_i) = 10 MHz (f_s) (3)

Therefore, the display frequency is equivalent to the reception frequency.

The subtraction of the 0.455 MHz (f_i) is accomplished by the conversion command device to the counter.

If the unit were designed to use the lower local oscillator frequency, a signal (preset frequency = +0.455 MHz) would be applied to the counter in order to add 0.455 MHz.

At the same time, in models which use different frequency, such as 2 MHz, for the intermediate frequency (f_i), a conversion signal is applied to the counter in order to add (or subtract) 2 MHz, so that the reception frequency will be correctly displayed.

In short, the conversion signal must be equal to $\pm f_i$.

II. Block Diagram

Figure 2 is a chart of the reception frequency, local oscillator frequency and intermediate frequency for each band.

Band	Signal Frequency (MHz)	Intermediate Frequency (MHz)	Local Osc. Frequency (MHz)
FM	87.5 ~ 108	10.7	98.2 ~ 118.7
LW	0.150 ~ 0.410	0.455	0.605 ~ 0.865
MW	0.525 ~ 1.610	0.455	0.980 ~ 2.065
SW1	3.2 ~ 8.0	2	5.2 ~ 10.0
SW2	8.0 ~ 16.0	2	10.0 ~ 18.0
SW3	16.0 ~ 30.0	2	18.0 ~ 32.0

Fig. 2

Because, the upper local oscillator frequency is used the conversion signal is subtracted from the counter circuit for each band.

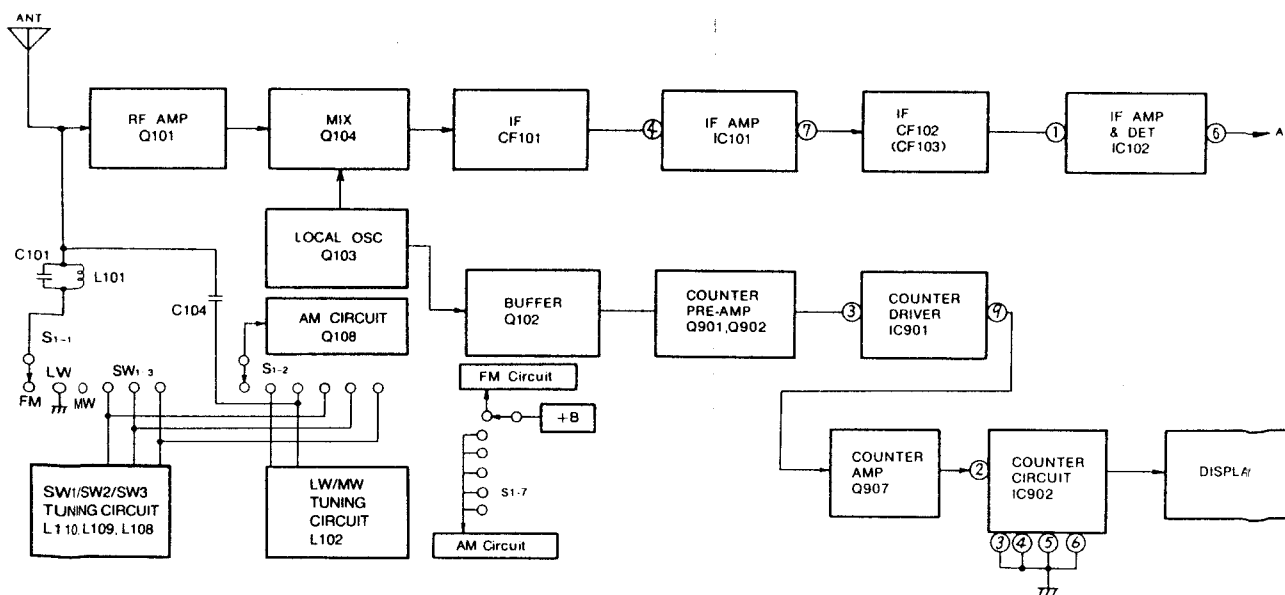
As can be understood from the table in figure 2, an intermediate frequency of 10.7 MHz is used for the FM band. Because the upper local oscillator frequency is used, the reception frequency is displayed after 10.7 MHz has been subtracted from the local oscillator frequency.

For the LW, MW bands, 455 kHz is subtracted from the local oscillator frequency.

For the SW bands, 2 MHz is subtracted from the local oscillator frequency.

Figures 3 and 4 are block diagrams which include the RF, Local Oscillator, IF and Counter circuits.

The subtraction is accomplished through logic signals applied to pins 3, 4, 5 and 6 of IC902.



NOTE:

1. IC902 terminal Nos. 3, 4, 5, 6 for Preset
L condition in terminals 3, 4, 5 and 6: -10.7MHz
2. S1: Band Selector
FM/LW/MW/SW1/SW2/SW3
shown at FM position.

Fig. 3 FM Section Block Diagram

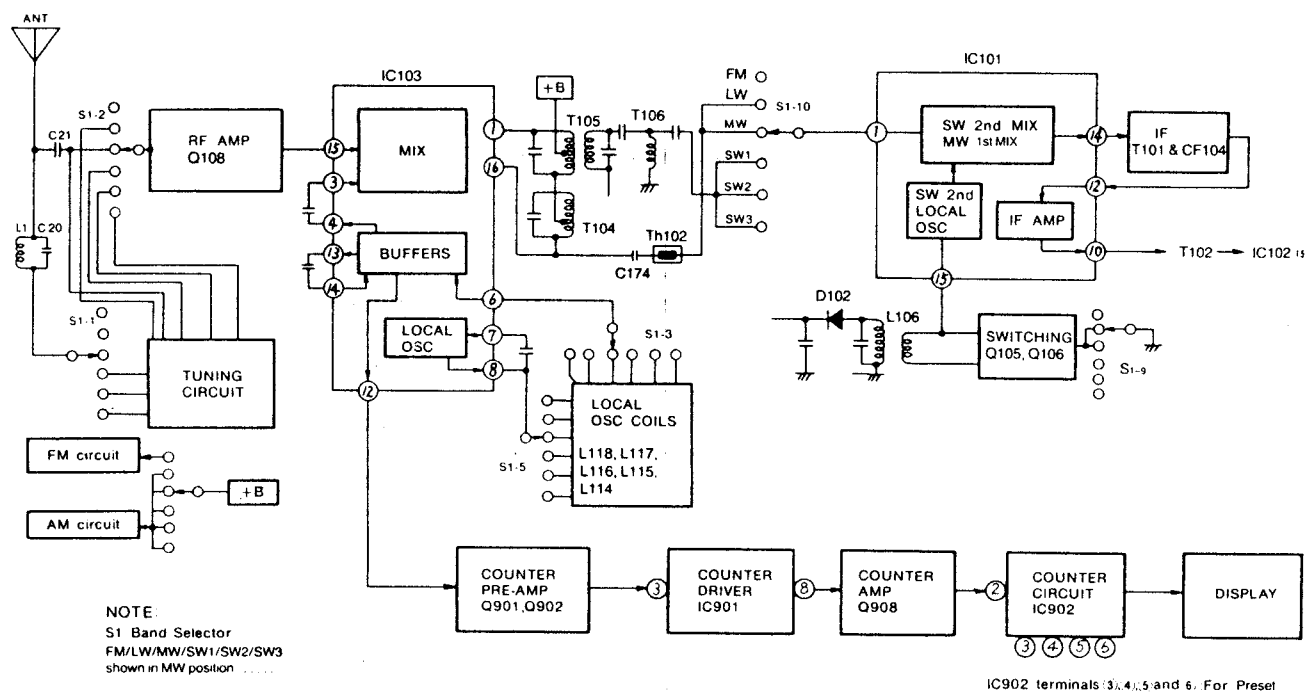


Fig. 4 LW/MW/SW Section Block Diagram

III. Preset Selector Circuit

Figure 5 shows the relationship between the preset terminals (3, 4, 5 and 6) of IC902 and the preset frequency.

Band	Preset terminal				Preset Frequency (MHz)
	3	4	5	6	
FM	L	L	L	L	-10.7
LW/MW	L	H	L	L	-0.455
SW1	H	H	H	L	-2.0
SW2	H	H	H	L	-2.0
SW3	H	H	H	L	-2.0

Fig. 5

Figure 6 shows the preset selector circuitry.

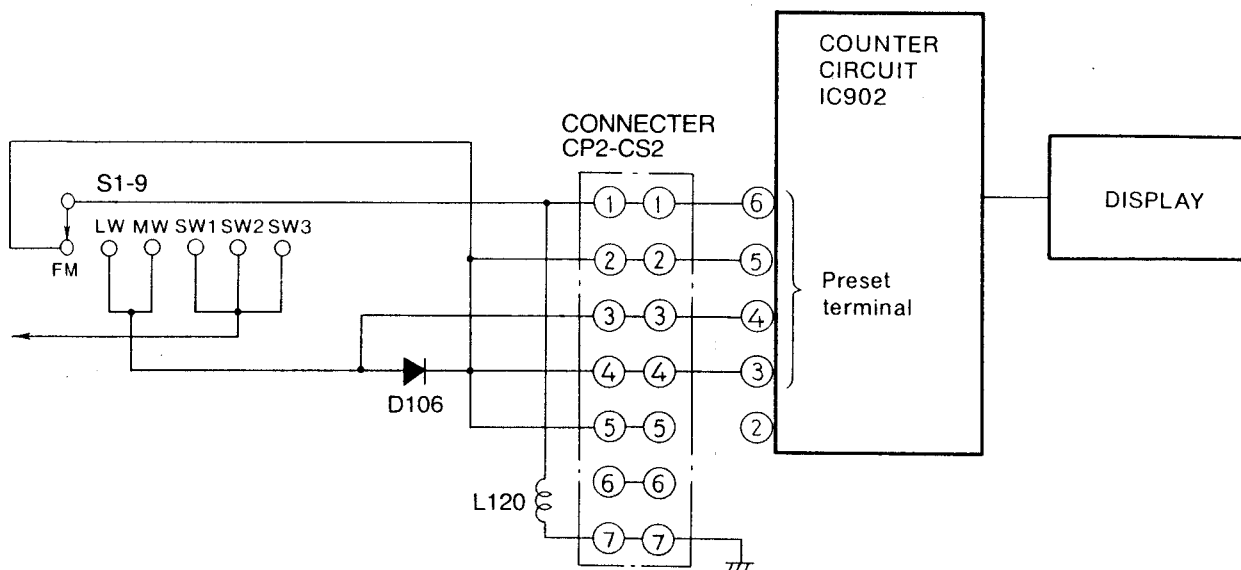


Fig. 6

A. For FM:

- (a) Terminal 6 of IC902 becomes an "L" level. (through connectors Pin 1→L120→Pin 7→GRND)
- (b) Terminal 5 of IC902 becomes an "L" level. (through S1-9→Connector Pin 2.)
- (c) Terminal 4 of IC902 becomes an "L" level. (through S1-9→D106→Connector Pin 3)
- (d) Terminal 3 of IC902 is set at an "L" level. (through S1-9→Connector Pin 4)

As a result, (refer to the table in figure 5) the counter circuit subtracts 10.7 MHz from the local oscillator frequency (the input signal), and the result is displayed as the reception frequency.

- B. In the same way, for the LW, MW and SW bands the condition of each preset terminal is changed by the band selector (S1-9) consequently, the preset frequency shown in the table in figure 5 is obtained, and the correct reception frequency is displayed.

IV. Counter Signal Circuitry

Figure 7 shows the counter signal circuitry.

- A. For each band, the local oscillator signal from the local oscillator circuitry is selected (FM, LW, MW or SW) by SW-A, and is supplied to terminal 3 of the driver circuit (IC901).
- B. This signal is frequency divided (1/8) by IC901, and is output from terminal 8. At the same time, a signal (frequency divided by 1/80) is output from terminal 9.

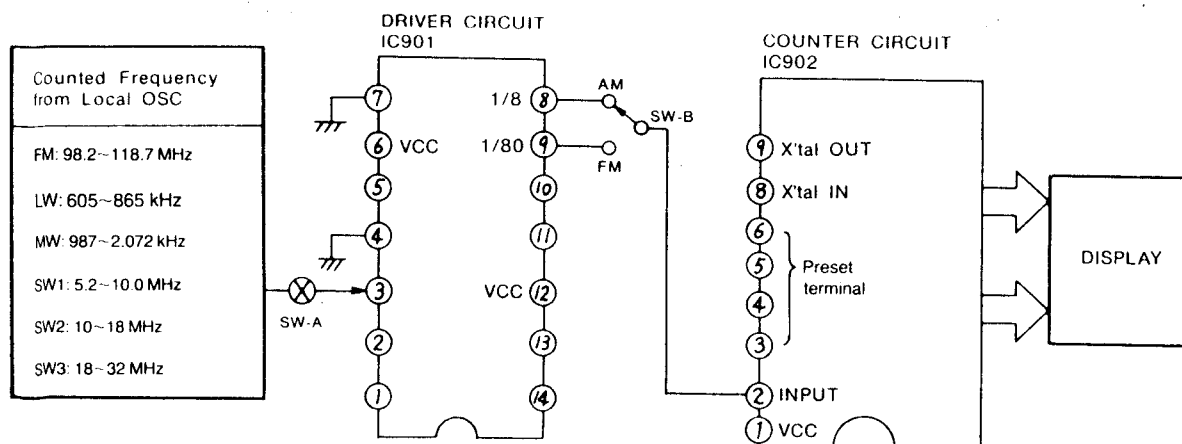


Fig. 7

- C. These two output signals are selected (by SW-B): the 1/8 frequency divided output (from terminal 8) for the LW, MW band and SW₁~SW₃ bands, and the 1/80 frequency divided output (from terminal 9) for the FM band are applied to the input terminal (terminal 2) of the counter circuit (IC902).
- D. These frequencies are converted, by IC902, into the original local oscillator frequencies. Moreover, depending upon the signal applied to the preset terminals, the necessary frequency for each band is subtracted from the derived local oscillator frequencies and the resulting frequency is supplied to the display.

V. Signal Selector Circuitry

Figure 8 shows the signal selector circuitry for the counter.

- A. For the FM band, since the band selector (S₁₋₉) is in the "FM" position, the base of each transistor (Q904, Q905 and Q906) becomes an "L" level, consequently, Q904 and Q905 turn on, and Q906 turns off. As a result, the signal from the FM band local oscillator flows as shown below, and is counted at the counter circuitry.

FM Local osc → C902 → Q901 → Q902 → C908 → IC901(3) → IC901(9) → C914 → Q907 → IC902(2)

In this case instance, the local oscillator circuitry for the LW, MW and SW bands does not function (refer to figures 3, 4 and the +B selector).

The signal (AM) from the 1/8 frequency divider is output from terminal 8 of IC901.

However, because Q905 is turned on thus shorting its collector to emitter junction, the base to emitter junction of Q908 is also shorted, therefore, the signal current can not flow to the counter circuit.

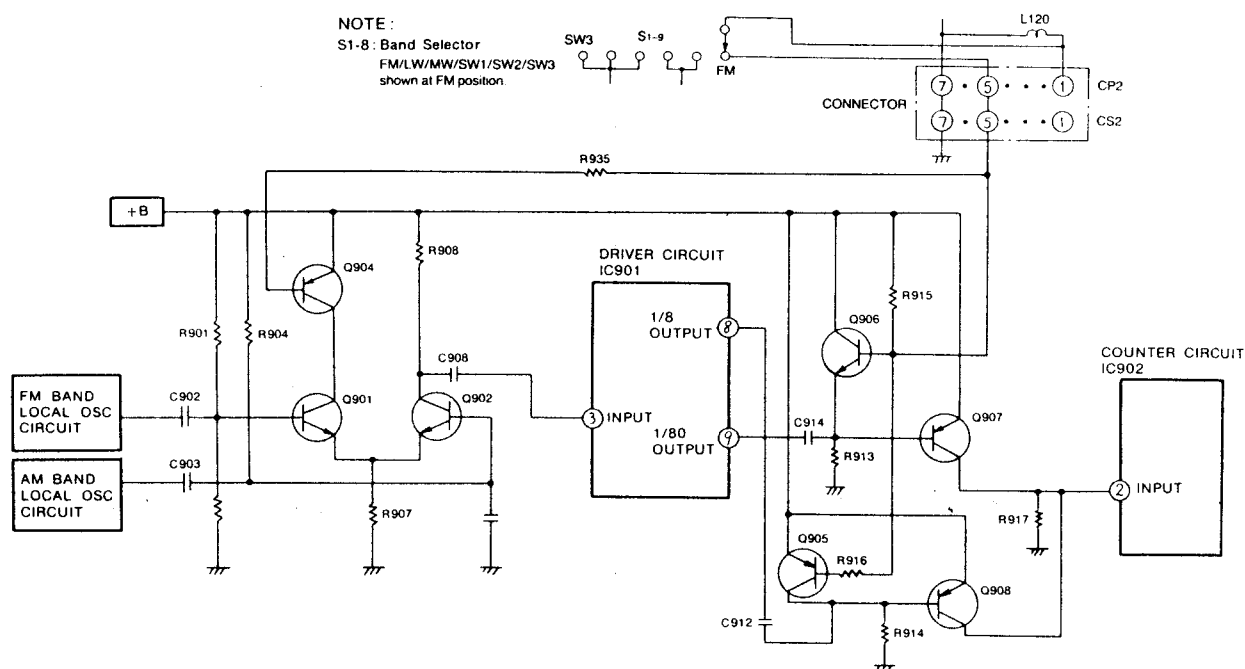


Fig. 8

- B. For the LW, MW and SW₁~SW₃ bands, S₁₋₉ is open, the base (Q904, Q905 and Q906) become an "H" level, consequently Q904 and Q905 turn off, and Q906 turns on. As a result, transistor Q907 turns off (base to emitter junction shorted by Q906) which results in Q901 turning off. Therefore, the signal from the AM local oscillator circuit flows as shown below, and is supplied to the counter circuitry (IC902).

AM local osc → C903 → Q902 → C908 → IC901(3) → IC901(8) → C912 → Q908 → IC902(2)

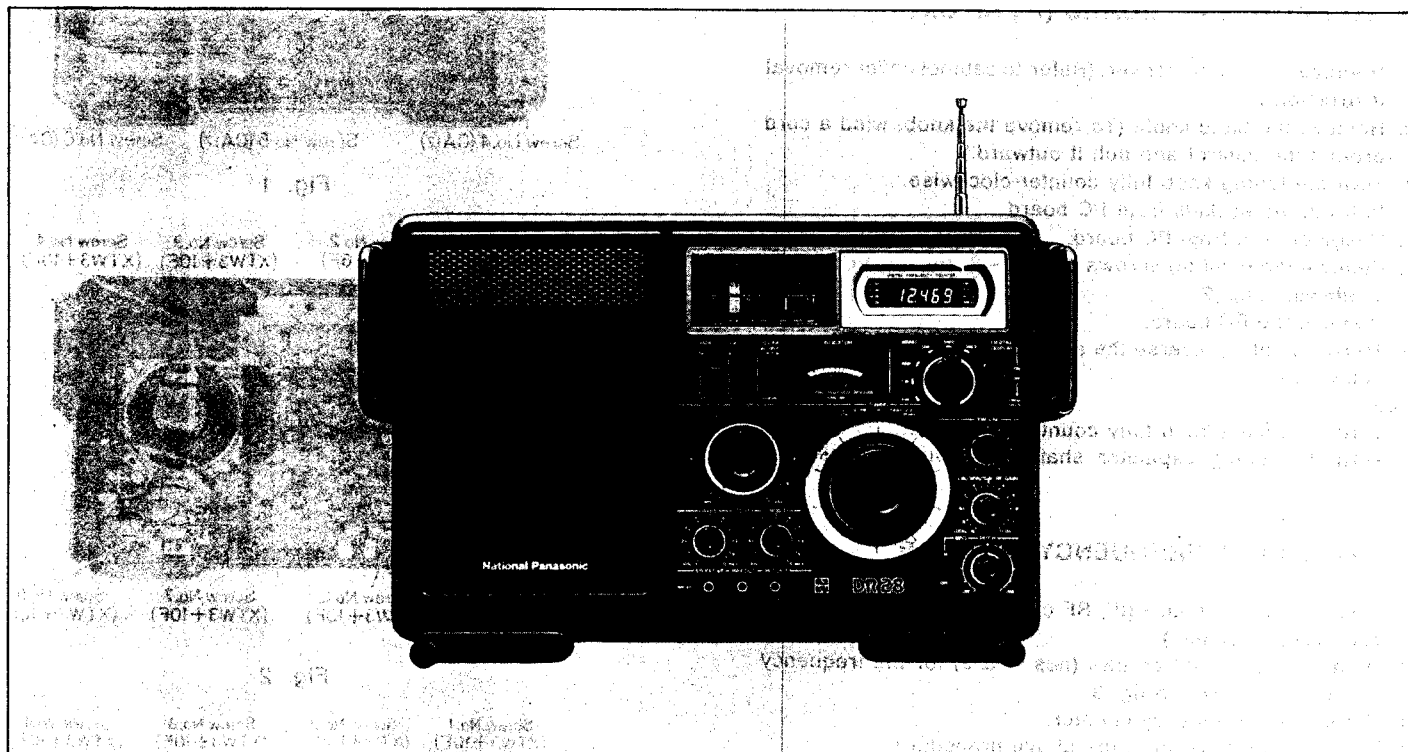
In this case, the local oscillator circuitry for the FM band does not function.

The above is a description of the operation of the frequency counter circuitry for models RF-2800/RF-2900. The frequency counter circuitry for other models is similar. Refer to RF-4900 Technical Information (Order No. RD8002-T1028), because the counter circuitry for models RF-2800/RF-2900 uses the same LSI as model RF-4900.

Service Manual

FM/LW/MW/SW
6-BAND PORTABLE RADIO

Radio
RF-2800LBS



■ SPECIFICATIONS

Frequency Range:	FM	87.5~108 MHz
	LW	150~410 kHz (2000~731m)
	MW	525~1610 kHz (571~186m)
Intermediate Frequency:	SW ₁	3.2~8 MHz (93.8~37.5m)
	SW ₂	8~16 MHz (37.5~18.7m)
	SW ₃	16~30 MHz (18.7~10m)
	FM	10.7 MHz
Sensitivity:	AM (LW, MW & SW)	455 kHz
	FM	2.5 μ V (S/N 26 dB), 2 μ V (3 dB down limiter sens.)
Power Output:	LW	70 μ V/m (S/N 6 dB), 600 μ V/m (S/N 26 dB)
	MW	30 μ V/m (S/N 6 dB), 400 μ V/m (S/N 26 dB)
	SW ₁	1.8 μ V (S/N 6 dB), 19 μ V (S/N 26 dB)
	SW ₂	0.8 μ V (S/N 6 dB), 9 μ V (S/N 26 dB)
	SW ₃	1.2 μ V (S/N 6 dB), 13 μ V (S/N 26 dB)
Power Output:		3W DC Maximum

Power Source:	AC 110~125V/220~240V 50~60 Hz or 9V (Six "D" Size Flashlight Batteries) (National UM-1 or equivalent)
Power Consumption:	11W (AC Only)
Speaker:	10 cm (4") PM Dynamic Speaker
Dimensions:	381(Wide) x 246(High) x 120(Deep)mm (15" x 9 7/8" x 4 3/4")
Weight:	2.3 kg. (8 lb. 10 oz.) without batteries
Impedance:	Speaker8 Ω Earphone Jack8 Ω Multiplex Out Jack10k Ω (40mV) FM Antenna Terminal75 Ω Phono Jack500k Ω (50mV) Recording Out Jack80k Ω (100mV)

Specifications are subject to change without notice for further improvement.

■ TO REMOVE CABINET COVER

1. Remove the battery cover.
2. Remove the six (6) screws (nos. 1~6) for the cabinet cover, as shown in fig. 1.
3. Remove the cabinet cover.
4. Pull out sockets from PC board.
5. To reassemble, reverse the above procedure.

■ TO REMOVE PC BOARD (IF, RF Circuit)

1. Remove the cabinet cover. (Refer to cabinet cover removal instruction.)
2. Remove the band knob. (To remove the knob, wind a cord around the control and pull it outward.)
3. Turn the tuning knob fully counter-clockwise.
4. Pull out the sockets from PC board.
5. Unsolder lead from PC board.
6. Remove the eight (8) screws (nos. 1~8) for the PC board, as shown in fig. 2.
7. Remove the PC board.
8. To reassemble, reverse the above procedure and note the followings.

Notes

1. Turn the tuning knob fully counter-clockwise.
2. Turn the tuning capacitor shaft fully counter-clockwise.

■ TO REMOVE FREQUENCY COUNTER

1. Remove the PC board (IF, RF circuit). (Refer to PC board removal instruction.)
2. Remove the two (2) screws (nos. 1 & 2) for the frequency counter, as shown in fig. 3.
3. Remove the frequency counter.
4. To reassemble, reverse the above procedure.

■ TO REMOVE PC BOARD (Frequency Counter)

1. Remove the frequency counter. (Refer to frequency counter removal instruction.)
2. Remove the four (4) screws (nos. 1~4) for the frequency counter cover, as shown in fig. 4.
3. Remove the two (2) screws (nos. 1 & 2) for the PC board, as shown in fig. 5.
4. Remove the PC board.
5. To reassemble, reverse the above procedure.

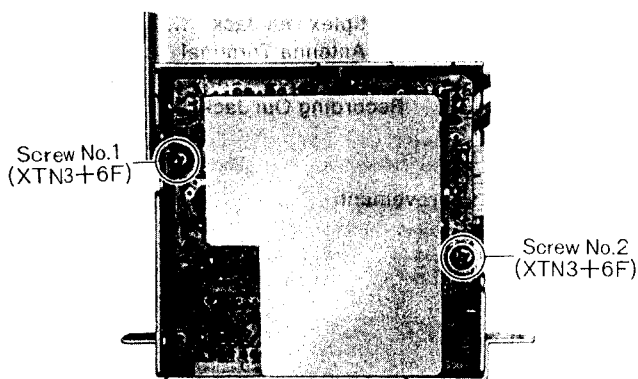


Fig. 5

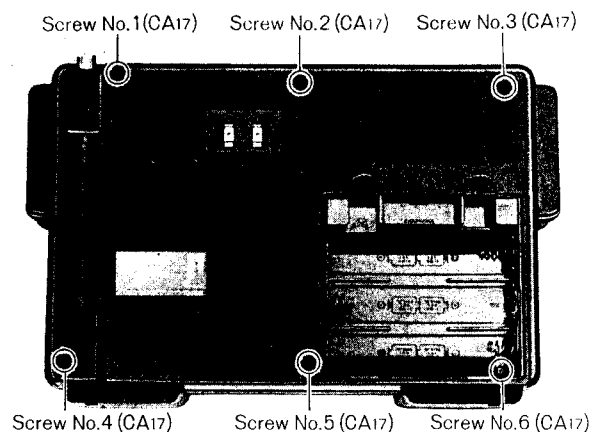


Fig. 1

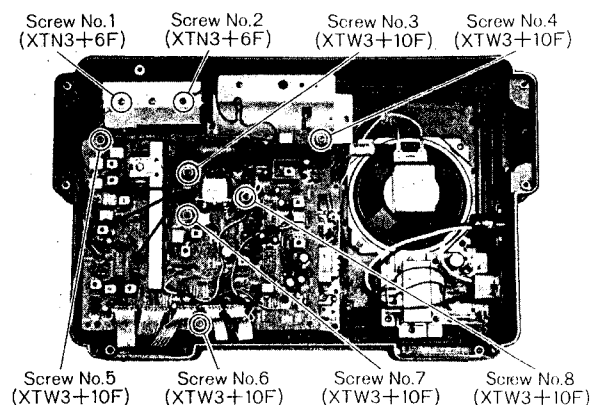


Fig. 2

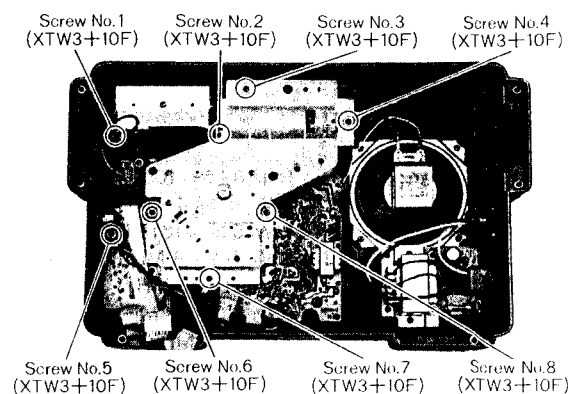


Fig. 3

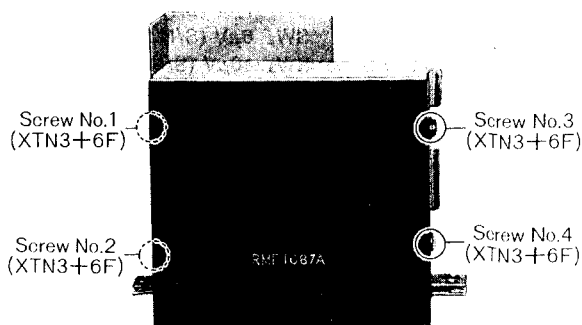


Fig. 4

■ TO REMOVE DIAL SCALE CHASSIS

1. Remove the PC board (IF, RF circuit). (Refer to PC board removal instruction.)
2. Remove the tuning knob.
3. Remove the six (6) screws (nos. 3~8) for the dial scale chassis, as shown in fig. 3.
4. Remove the dial scale chassis.

■ TO REMOVE DIAL MECHANISM

1. Remove the dial scale chassis. (Refer to dial scale removal instruction.)
2. Remove the dial belt, as shown in fig. 7.
3. Remove the two (2) screws (nos. 1 & 2) for the dial mechanism, as shown in fig. 6.
4. To reassemble, reverse the above procedure and note the followings.

Notes

1. Turn the tuning shaft fully counter-clockwise.
2. Set the dial scale at the position, as shown in fig. 7.
3. Attach the dial belt.
4. Refer to dial scale removal instruction.

■ TO REMOVE DIAL SCALE

1. Remove the dial scale chassis. (Refer to the dial scale chassis removal instruction.)
2. Remove the one (1) screw for the dial scale spring, as shown in fig. 7.
3. Remove the dial scale.
4. To reassemble, reverse the above procedure and note the followings.

Notes:

1. Loosen the two (2) screws (nos. 1 & 2) for the dial scale gear, as shown in fig. 8.
2. Set the catch of dial scale gear to the start point of dial scale, as shown in fig. 9.
3. Turn the tuning shaft fully counter-clockwise.
4. After mounting the PC board (IF, RF circuit), turn the dial scale by pushing the catch of dial scale and set the start point of dial scale to the catch of cabinet, as shown in fig. 10.
5. Tighten the two (2) screws (nos. 1 & 2) for the dial scale gear, as shown in fig. 10.

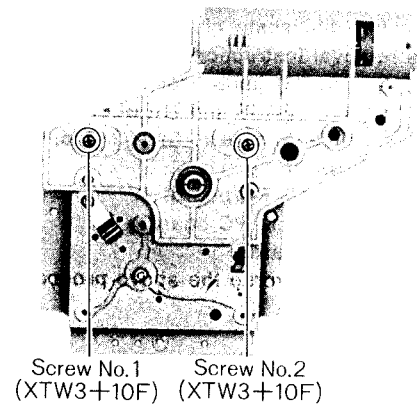


Fig. 6

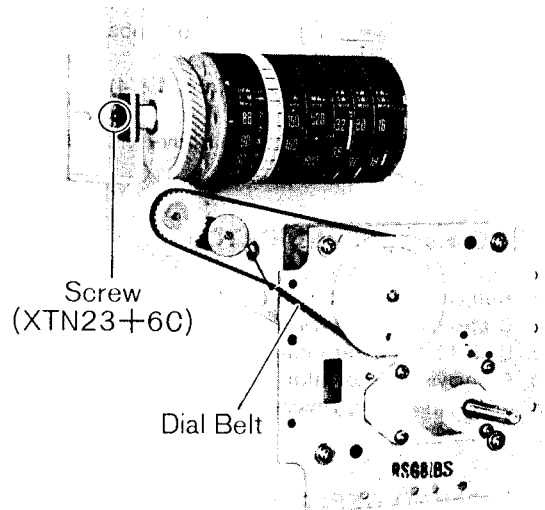


Fig. 7

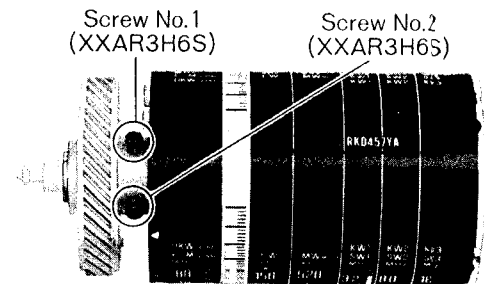


Fig. 8

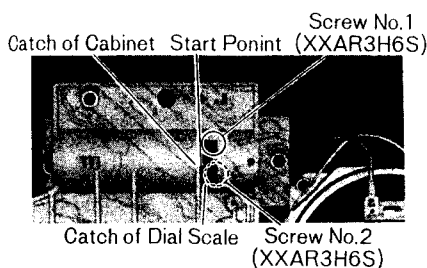


Fig. 10

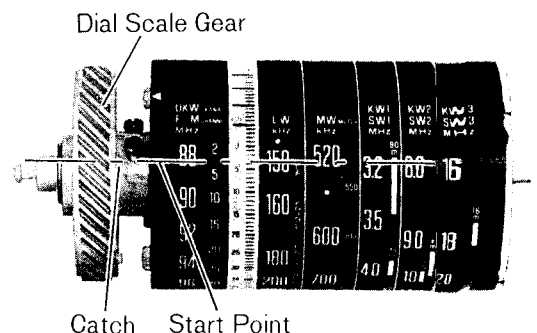


Fig. 9

■ TO REMOVE PC BOARD (AF Circuit)

1. Remove the dial scale chassis. (Refer to the dial scale chassis removal instruction.)
2. Remove the six (6) knobs for the RADIO, LIGHT, BAND WIDTH, VOLUME, BASS and TREBLE.
3. Remove the five (5) screws (nos. 2, 3, 5, 6 & 7) for the PC board, as shown in fig. 11.
4. Unsolder lead from PC board.
5. Pull out sockets from PC board.
6. Remove the PC board.
7. To reassemble, reverse the above procedure.

■ TO REMOVE PC BOARD (Control Circuit)

1. Remove the dial scale chassis. (Refer to the dial scale chassis removal instruction.)
2. Remove the three (3) knobs for the SW CAL, RF GAIN and PITCH. (To remove those control knobs wind a cord around the control and pull it outward.)
3. Remove the two (2) screws (nos. 1 & 4) for the PC board.
4. Remove the PC board.
5. To reassemble, reverse the above procedure.

■ TO REMOVE INDICATOR

1. Remove the PC board (AF circuit).
(Refer to PC board removal instruction.)
2. Unsolder the terminal of indicator, as shown in fig. 12.
3. Remove the Indicator.
4. To reassemble, reverse the above procedure.

■ HOW TO REPLACE CHIP

1. Remove solder for chip completely.
2. Remove chip by nippers, as shown in fig. 13.
3. Use tube for service parts as shown in fig. 14 and solder service parts according to following table. (please refer to Circuit Board Wiring View for the value of resistor and capacitor).

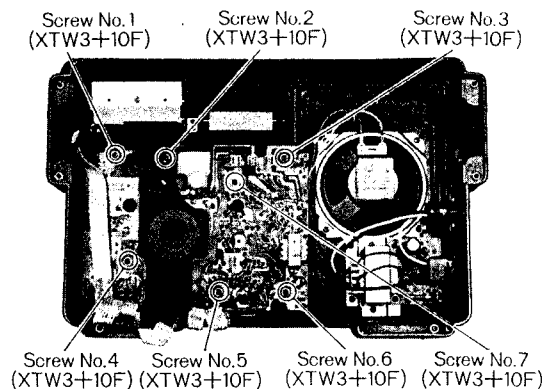


Fig. 11

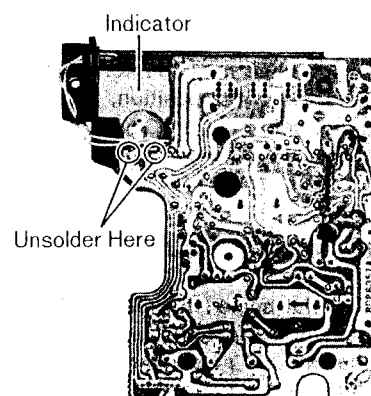


Fig. 12

Color	Original Parts Name	Service Parts Name
Black	Chip Resistor	Carbon Resistor
Brown	Chip Capacitor	Ceramic Capacitor
Blue	Chip Jumper	Lead Wire

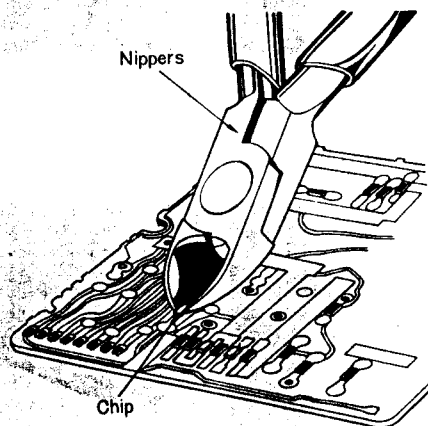


Fig. 13

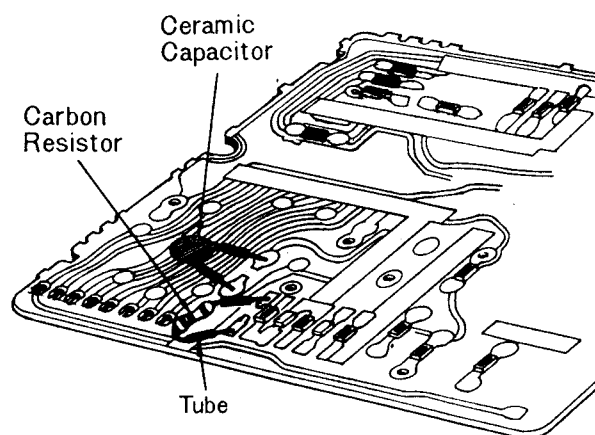


Fig. 14

■ BLOCK DIAGRAM

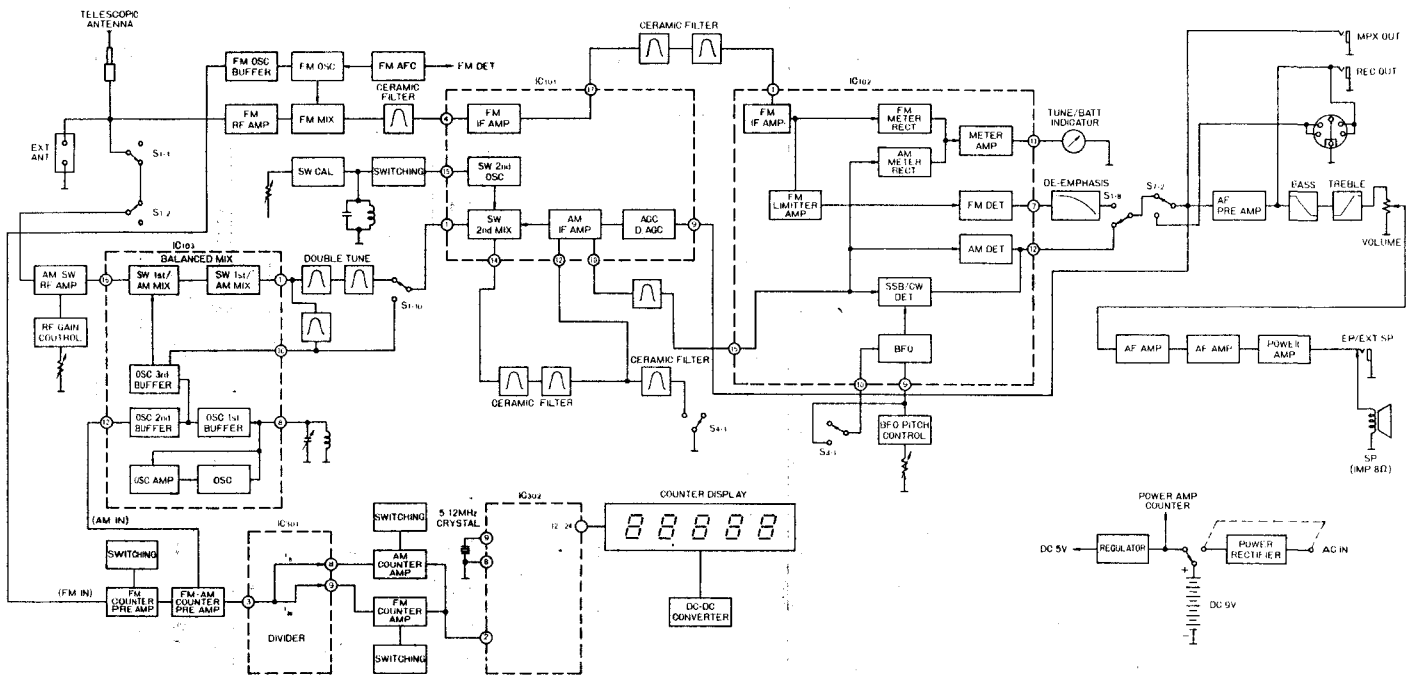


Fig. 15

■ ALIGNMENT POINTS

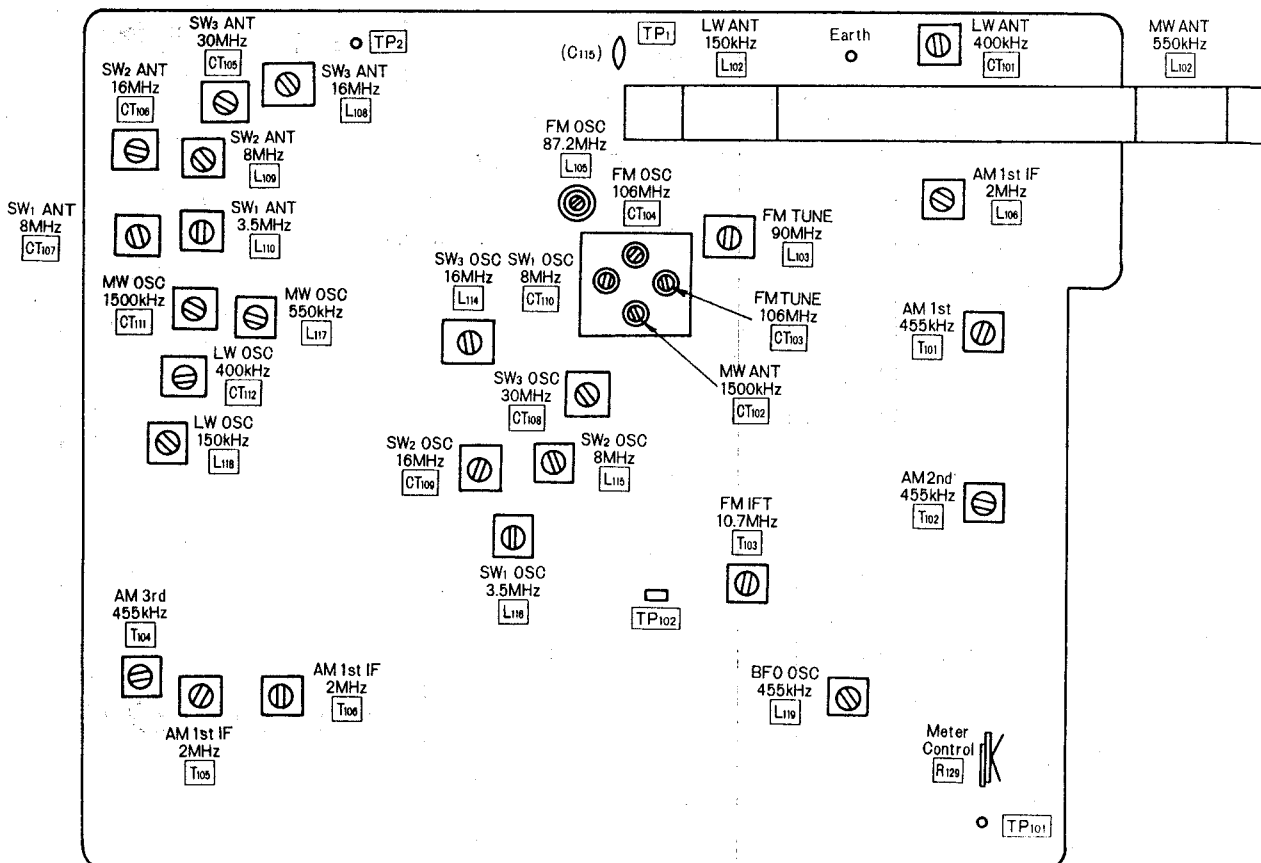


Fig. 16

■ ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set volume control to maximum.
2. Radio ON/OFF switch to ON.
3. Set bass and treble control to maximum.
4. Set band switch to MW, LW, SW or FM.
5. Set digital display switch to OFF position.
6. Set RF gain control to high.
7. Light switch to OFF position.
8. Set FM AFC/Band width switch to narrow, OFF position for the AM-IF, BFO, and FM adjustment, and to wide ON position for other adjustment.
9. Set pitch control to center.
10. Set BFO switch to ON position for BFO adjustment, and to OFF position for other adjustment.
11. Set SW Cal control to center.
12. Set power source voltage to 9V DC.
13. Output of signal generator should be no higher than necessary to obtain an output reading.

■ AM AND SW ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
AM-2nd IF ALIGNMENT						
(1) AM	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. at 400 Hz	Point of non-interference.	Output meter across voice coil.	T ₁₀₁ (AM 1st IFT) T ₁₀₂ (AM 2nd IFT) T ₁₀₄ (AM 3rd IFT)	Adjust for maximum output.
LW-RF ALIGNMENT						
(2) LW	"	150 kHz	150 kHz (Refer to fig. 17)	Output meter across voice coil	L ₁₁₈ (LW OSC Coil) (*) L ₁₀₂ (LW ANT Coil)	Adjust for maximum output. Adjust L ₁₀₂ by moving coil bobbin along ferrite core.
(3) LW	"	400 kHz	400 kHz (Refer to fig. 18)	"	CT ₁₁₂ (LW OSC Trimmer) CT ₁₀₁ (LW ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).
MW-RF ALIGNMENT						
(4) MW	"	550 kHz	550 kHz (Refer to fig. 19)	Output meter across voice coil	L ₁₁₇ (MW OSC Coil) (*) L ₁₀₂ (MW ANT Coil)	Adjust for maximum output. Adjust L ₁₀₂ by moving coil bobbin along ferrite core.
(5) MW	"	1500 kHz	1500 kHz (Refer to fig. 20)	"	CT ₁₁₁ (MW OSC Trimmer) CT ₁₀₂ (MW ANT Trimmer)	Adjust for maximum output. Repeat steps (4) and (5).
(*) Cement antenna bobbin with wax after completing alignment.						
AM-1st IF ALIGNMENT						
(6) SW ₁	Connect to EXT ant. terminal through ceramic capacitor (10 PF). Negative side to earth	2 MHz	Point of non-interference.	"	L ₁₀₆ (AM 1st IFT) T ₁₀₅ (AM 1st IFT) T ₁₀₆ (AM 1st IFT)	Adjust for maximum output.
SW ₁ -RF ALIGNMENT						
(7) SW ₁	"	3.5 MHz	3.5 MHz (Refer to fig. 21)	Output meter across voice coil.	L ₁₁₆ (SW ₁ OSC Coil) L ₁₁₀ (SW ₁ ANT Coil)	Adjust for maximum output.
(8)	"	8.0 MHz	8.0 MHz (Refer to fig. 22)	"	CT ₁₁₀ (SW ₁ OSC Trimmer) CT ₁₀₇ (SW ₁ ANT Trimmer)	Adjust for maximum output. Repeat steps (7) and (8).
SW ₂ -RF ALIGNMENT						
(9) SW ₂	"	8.0 MHz	8.0 MHz (Refer to fig. 23)	"	L ₁₁₅ (SW ₂ OSC Coil) L ₁₀₉ (SW ₂ ANT Coil)	Adjust for maximum output.
(10) SW ₂	"	16 MHz	16 MHz (Refer to fig. 22)	"	CT ₁₀₉ (SW ₂ OSC Trimmer) CT ₁₀₆ (SW ₂ ANT Trimmer)	Adjust for maximum output. Repeat steps (9) and (10).
SW ₃ -RF ALIGNMENT						
(11) SW ₃	"	16 MHz	16 MHz (Refer to fig. 23)	"	L ₁₁₄ (SW ₃ OSC Coil) L ₁₀₈ (SW ₃ ANT Coil)	Adjust for maximum output.
(12) SW ₃	"	30 MHz	30 MHz (Refer to fig. 24)	"	CT ₁₀₈ (SW ₃ OSC Trimmer) CT ₁₀₅ (SW ₃ ANT Trimmer)	Adjust for maximum output. Repeat steps (11) and (12).

■ FM ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS	
	CONNECTIONS	FREQUENCY					
FM-IF ALIGNMENT							
(1)	FM	Connect to test point TP₁ through 0.001 μ F. Negative side to earth.	10.7 MHz	Point of non-interference.	Connect vert. amp. of scope to test point TP₁₀₂ . Negative side to earth.	T ₁₀₃ (FM IFT)	Adjust for maximum amplitude. (Refer to fig. 27)
FM-RF ALIGNMENT							
(2)	FM	Connect to test point TP₂ through FM dummy antenna. (Refer to fig. 28).	87.2 MHz	Variable capacitor fully closed.	Output meter across voice coil.	L ₁₀₅ (FM OSC Coil)	(*) Adjust for maximum output.
(3)	FM	"	90 MHz	90 MHz (Refer to fig. 25)	"	L ₁₀₃ (FM TUNE Coil)	(*) Adjust for maximum output.
(4)	FM	"	106 MHz	106 MHz (Refer to fig. 26)	"	CT ₁₀₄ (FM OSC Trimmer) CT ₁₀₃ (FM TUNE Trimmer)	(*) Adjust for maximum output. Repeat steps. (3)~(4)
(*) Three output responses will be present; proper tuning is the center frequency.							

■ BFO ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
BFO ALIGNMENT Note: Set band width switch to "Narrow".						
SW ₁	Fashion loop of several turns of wire and radiate signal into loop of receiver.	3.5 MHz	Tune to signal.	Audio output from speaker.	L ₁₁₉ (BFO OSC Coil)	1. Cut off modulation after tune to signal. 2. Set BFO switch to ON. 3. Adjust for zero beat.

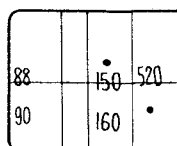
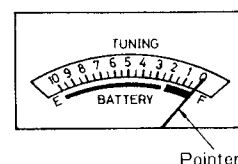
■ TUNE/BATT METER ADJUSTMENT

1. RADIO RECEIVER SETTING

- Set band switch to AM.
- Set volume control MIN.
- Set switch to.
- Set BFO switch to OFF.
- Set power source voltage to 9 volts DC.

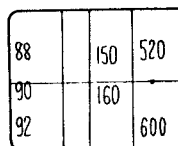
2. REMARKS

- Adjust R₁₂₉ so that the pointer of meter stays as shown in figure right.



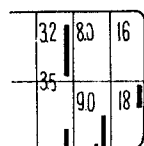
LW (150 kHz)

Fig. 17



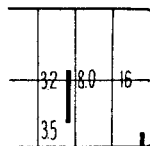
MW (550 kHz)

Fig. 19



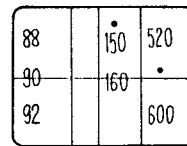
SW₁ (3.5 MHz)

Fig. 21



SW₂ (8 MHz)
SW₃ (16 MHz)

Fig. 23

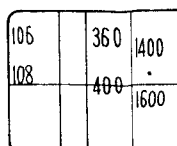


FM (90 MHz)

Fig. 25

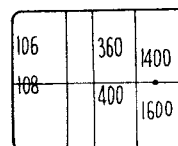


Fig. 27



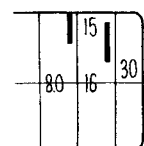
LW (400 kHz)

Fig. 18



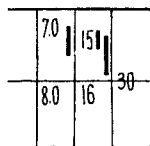
MW (1500 kHz)

Fig. 20



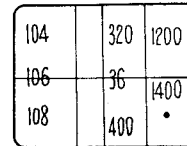
SW₁ (8 MHz)
SW₂ (16 MHz)

Fig. 22



SW₃ (30 MHz)

Fig. 24



FM (106 MHz)

Fig. 26

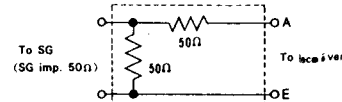
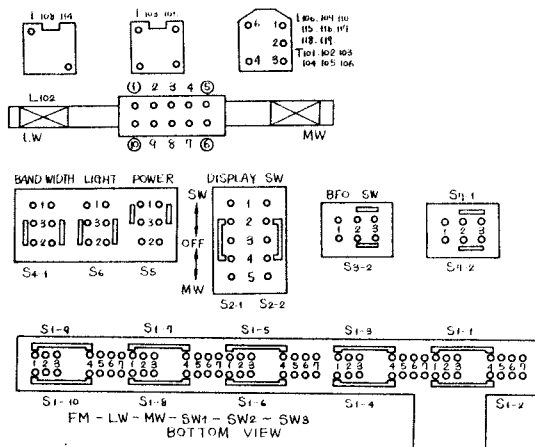
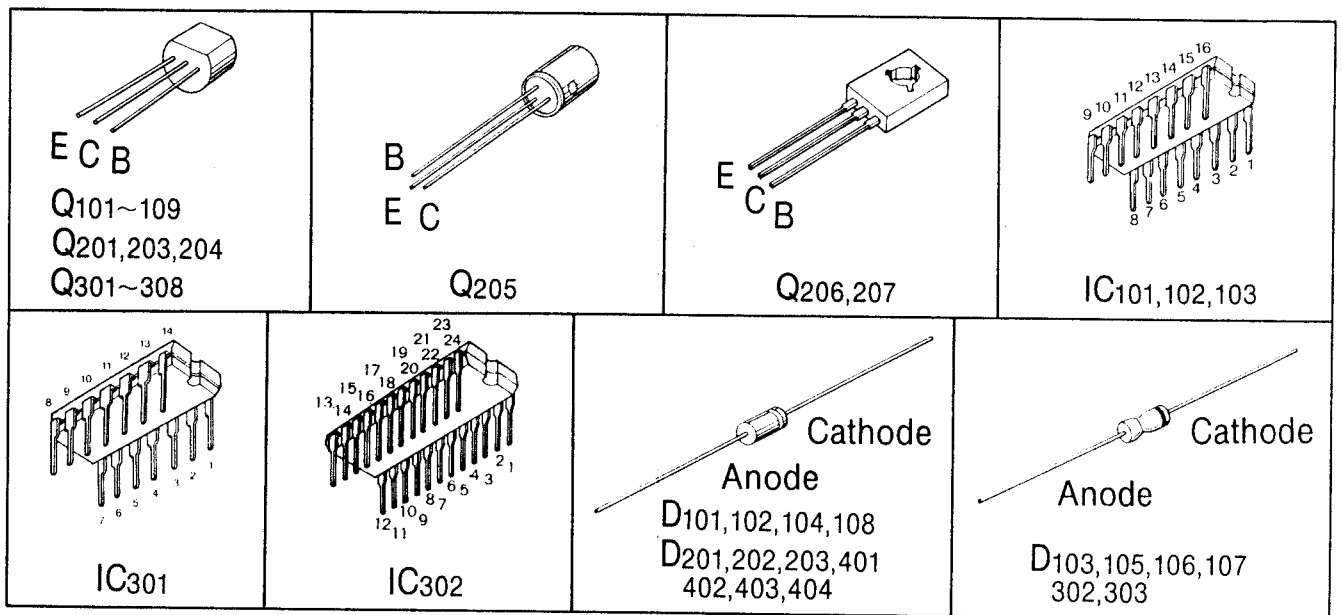


Fig. 28



Notes:

1. S₁₋₁~S₁₋₁₀: Band switch in "FM" position.
2. S₂₋₁, S₂₋₂: Digital display switch in "OFF" position.
3. S₃₋₁, S₃₋₂: BFO switch in "OFF" position.
4. S₄₋₁: Band width switch in "NARROW" position.
5. S₅: Radio ON/OFF switch in "OFF" position.
6. S₆: Light switch in "OFF" position.
7. S₇: Phono/Radio switch in "Radio" position.
8. S₈: Voltage selector switch.
9. DC voltage measurements are taken with 10 k Ω /V voltmeter from negative terminal of battery.
☐.....FM position ().....AM position
☐.....SW position
10. o mark.....chip resistor and capacitor.
11. Battery current. No signal36 mA
 Maximum output600 mA



VOLTAGE

Q 101

	FM
D	3.3V
G	0V
S	0V
I _b	3.5mA

Q 102

	FM	AM
C	4.8V	0V
B	1.47V	0V
E	0.85V	0V

Q 103

	FM
C	0V
B	1.2V
E	2.1V
I _b	0.4mA

Q 104

	FM
C	0V
B	3.5V
E	4.4V
I _b	0.8mA

Q 105

	FM	AM	SW
C	0.66V	4.45V	4.45V
B	0.18V	3.7V	4.15V
E	0.66V	4.45V	4.45V

Q 106

	FM	AM	SW
C	0.2V	0.12V	4.2V
B	0.63V	0.63V	0.1V
E	0V	0V	0V

Q 107

	FM	AM
C	1.8V	
D	0V	2.1V
G	0V	0V
S	0V	0V
I _b	2.3mA	2.3mA

Q 108

	FM	AM
D	0V	2.1V
G	0V	0V
S	0V	0V
I _b	2.3mA	2.3mA

Q 109

	FM	AM
C	0.7V	5.2V
B	0.4V	2.7V
E	0V	2.1V
I _b	2.3mA	2.3mA

Q 201

	FM	AM
C	8.3V	
H	5.4V	
E	5.3V	

Q 202

	FM	AM
C	5.3V	
B	8.3V	
E	9V	

Q 203

	FM	AM
C	2.3V	
B	0.3V	
E	0.0V	

Q 204

	FM	AM
C	1.95V	
H	0.38V	
E	0.43V	
I _b	1.2mA	

Q 205

	FM	AM
C	0.25V	
B	3.5V	
E	3.75V	

Q 206, 207

	FM	AM
C	9V	
H	0.64V	
E	0V	

Q 901

	FM	SW
C	4.8V	0.17V
B	1.25V	0.85V
E	0.56V	0.17V

Q 902

	FM	SW
C	3.5V	0.34V
H	0.53V	0.53V
E	0.56V	0.17V

Q 903

	FM	AM
C	4V	
B	0.06V	
E	0V	

Q 904

	FM	SW
C	4.8V	0.17V
B	4.2V	4.3V
E	4.9V	4.9V

Q 905

	FM	SW
C	4.9V	4.9V
B	4.3V	4.3V
E	4.9V	4.9V

Q 906

	FM	SW
C	4.9V	4.9V
B	0V	4.2V
E	4.2V	4.3V

Q 907

	FM	SW
C	2.5V	3.35V
B	4.2V	4.3V
E	4.9V	4.9V

Q 908

	FM	SW
C	2.5V	3.35V
B	4.9V	4.9V
E	4.9V	4.9V

IC 101

	FM	AM	FM	AM	
1	0.15V	0.7V	9	0V	0.3V
2	0.15V	0.7V	10	0.7V	4.7V
3	0V	0V	11	1.7V	2.6V
4	3.6V	0V	12	0.3V	0.9V
5	3.6V	0V	13	0.7V	4.4V
6	4.9V	0V	14	0.7V	4.4V
7	3.7V	0V	15	0.7V	4.4V
8	0V	0V	16	0.3V	3.7V

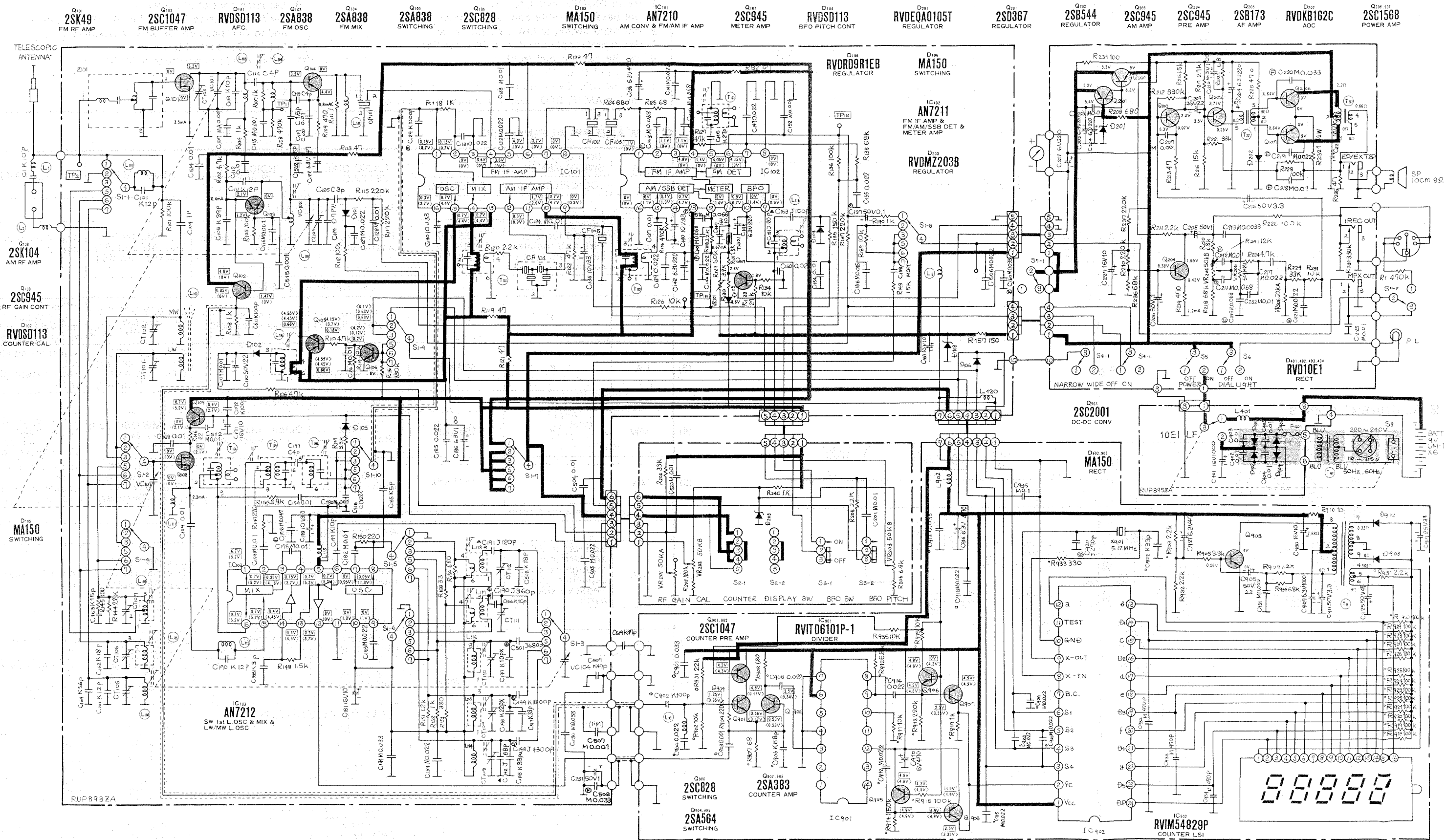
IC 102

	FM	AM	FM	AM	
1	1.1V	0V	9	0V	0.6V
2	1.1V	0V	10	0V	1.4V
3	1.1V	0V	11	0.9V	0.7V
4	4.9V	0V	12	0V	0.4V
5	1.4V	0V	13	0.7V	4.7V
6	4.05V	0V	14	0.1V	1.3V
7	4.15V	0V	15	0V	1.1V
8	0V	0V	16	0V	0V

IC 103

	FM	AM	FM	AM	
1	0.7V	5.2V	9	0V	1V
2	0.7V	5.2V	10	0V	1.3V
3	0.35V	4.6V	11	0V	0V
4	0.15V	3.7V	12	0.2V	3.7V
5	0.7V	5.2V	13	0.4V	4.5V
6	0.7V	5.2V	14	0.4V	4.45V
7	0V	0.95V	15	0.7V	5.2V
8	0.05V	1.3V	16	0.7V	5.2V

Schematic Diagram - Model RF-2800LBS



C	101 108 522 104 514 107 108 111 119 114 115 112 116 110 107 117 118 119 122 124 125 127 126 128 129 130 120 185 131 186 191 132 133 192 195 501 134 124 135 505 509 136 137 138 142 139 141 140 143 145 144 146 510 149 148 152 151 153 150 154 155 156 157 201 158 523 913 916 506 160 205 202 203 204 206 207 209 210 211 212 214 215 216 217 218 219 220 221 223 225																																																																																																			
R	167 163 162 161 168 169 170 521 172 171 511 173 175 176 178 515 188 180 182 179 516 181 183 194 165 184 166 190 197 196 517 199 502 230 193 504 509 508 519 507 92 901 904 147 903 906 908 912 910 14 167 918 915 935 923 924 921 920 239 227 933 922 932 931 227 208 213 401 935 402 493 404 405 911 907 931 930 925 917 208 210 236 289 212 215 216 214 211 221 218 222 225 228 226 232 235 234 231 730 29 938 927 235 925 145 144 146 147 148 155 112 150 151 152 153 154 158 157 156 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600 2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613 2614 2615 2616 2																																																																																																			

REPLACEMENT PARTS LIST..... Model RF-2800LBS (RD7803-1549)

NOTES: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. X - Z rank: X rank parts will cover 80% of repair needs.
X + Y rank parts will cover 95% of repair needs.
Z rank parts are less necessary.
3. Components identified by shaded area have special characteristic important for safety.
When replacing any of these components use only manufacturer's specified parts.
4. Part numbers shown in bold letters are service standard parts and may differ from production parts.
5. The O mark is used by the manufacturing plant only.

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
INTEGRATED CIRCUITS, TRANSISTORS AND DIODES				
IC101	AN7210	IC, FM/AM IF Amp.	1	O X
IC102	AN7211	IC, FM IF/Detector, AM, SSB Detector	1	O X
IC103	AN7212	IC, SW 1st L. Oscillator, Mix. LW/MW L. Oscillator	1	O X
IC901	RV1TD6101P-1	IC, Divider	1	O X
IC902	RV1M54829P	IC, Counter LSI	1	O X
Q101	2SK49	Transistor (Si), FM RF Amp.	1	X
Q102, 901, 902	2SC1047	Transistor (Si), Buffer Amp., Counter Pre Amp.	3	X
Q103, 104, 105	2SA838	Transistor (Ge), FM Oscillator, Mix, Switching, Counter Amp.	5	X
Q07, 908	2SC828	Transistor (Si), Switching	2	X
Q106, 906	2SC945	Transistor (Si), Meter Amp., RF Gain Control, Pre Amp., AF Amp.	4	X
Q107, 109, 203, 204	2SK104	Transistor (Si), Regulator	1	X
Q108	2SD367	Transistor (Si), Regulator	1	X
Q201	2SB544	Transistor (Ge), AF Amp.	1	X
Q202	2SB173	Transistor (Si), Regulator	1	X
Q205	2SC1568	Transistor (Si), AF Amp.	1	X
Q206, 207	2SC2001	Transistor (Si), Oscillator, Power Amp.	1	X
Q903	2SA564	Diode (Si), AFC, Counter Cap., BFO Pitch Control	2	X
Q905, 904	RVDS113	Diode (Si), Switching, Rectifier	3	X
D101, 102, 104	MA161	Diode (Si), Regulator	5	X
D103, 105, 106, 902, 903	RVDWZ094	Diode (Si), Regulator	1	X
D108	RVDEQA0105T	Diode (Si), Operation Compensator	1	O X
D201	RVDKB162C	Diode (Si), Regulator	1	X
D202	RVDWZ203B	Diode (Si), Rectifier	1	X
D203	SM112		4	X
D401, 402, 403, 404				
RECTIFIER				
Th101	RRT800	Thermistor, Temperature Compensator	1	X

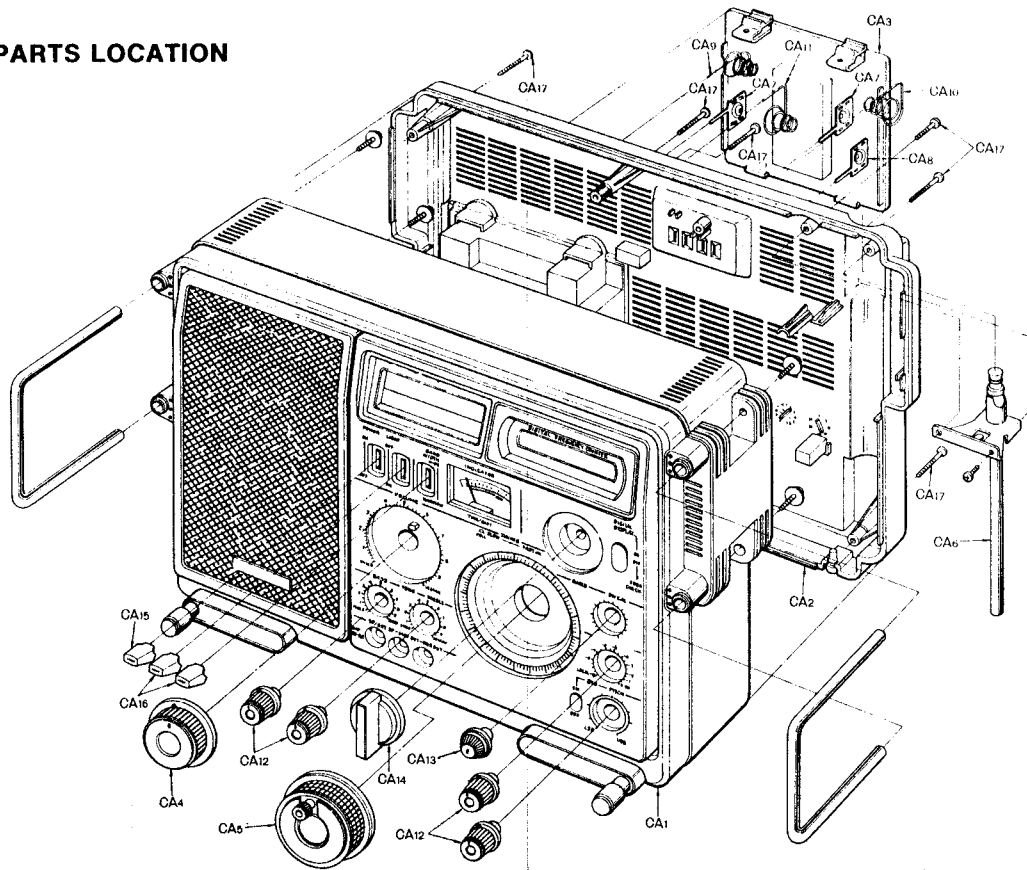


Fig. 29

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
CERAMIC FILTERS, COILS AND TRANSFORMERS				
CF101,102,103	RVFCF10S12FR	Ceramic Filter	3	X
CF104	RVFLFB6A	Ceramic Filter	1	OX
CF105	RVFBFB455C2	Ceramic Filter	1	OX
L102	RLF6F20	Antenna Coil,MW,LW	1	OX
L103	RLD4M9	Tuning Coil,FM	1	OX
L105	RLO4N105	Oscillator Coil,FM	1	OX
L106	RLO9M10	IFT,AM 1st IF	1	OX
L108	RLD7M3	Antenna Coil,SW3	1	OX
L109	RLA3M30	Antenna Coil,SW2	1	OX
L110	RLA3M40	Antenna Coil,SW1	1	OX
L114	RLD4M5	Oscillator Coil,SW3	1	OX
L115	RLO3M49	Oscillator Coil,SW2	1	OX
L116	RLO3M48	Oscillator Coil,SW1	1	OX
L117	RLO2M14	Oscillator Coil,MW	1	OX
L118	RLO1M8	Oscillator Coil,LW	1	OX
L119	RLO9M9	Oscillator Coil,BFO	1	OX
T101	RLI2M212	IFT,AM 2nd IF	1	X
T102	RLI2M205	IFT,AM 2nd IF	1	X
T103	RLI4M101	IFT,FM	1	X
T104	RLI2M204	IFT,AM 2nd IF	1	X
T105	RLI9M3	IFT,AM 1st IF	1	X
T106	RLI9M4	IFT,AM 1st IF	1	X
T201	RLT3F30	Input Transformer,P=700Ω:S=1KΩ	1	X
T202	RLT2H28	Output Transformer,P=45Ω:S=8Ω	1	X
T901	RLT9E2	Power Transformer,Time Display	1	OX
T401	RLT5K118	Power Transformer	1	OX
VARIABLE RESISTORS				
VR201,205,206	EVH0XAF15A54	Variable Resistor,50KΩ(A),RF Gain, Treble, Volume	3	X
VR202,203,204	EVH0XAF15B54	Variable Resistor,50KΩ(B),SW Cal, BFO Pitch,Bass	3	X
VR101	EVL4AA00B54	Preset,50KΩ(B),Meter	1	X
VARIABLE CAPACITORS				
CV101,102,103,104	PVC22K20T5L	Tuning Capacitor,W/Trimmer Capacitor(CT102,103,104,110)	1	Y
CT107,111	RCV1PX10AGS	Trimmer Capacitor	2	Y
CT101	RCV1PX15AGS	Trimmer Capacitor	1	Y
CT112	RCV1PX20AGS	Trimmer Capacitor	1	Y
CT105,106,108,109	RCV1PX30AGS	Trimmer Capacitor	4	Y
COMPONENT COMBINATION AND CRYSTAL				
Z101	RXABPMF1	Component Combination	1	Y
X901	RVCX5120N5Z	Crystal	1	OX

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
SPEAKER				
SP	EAS10P57SC	Speaker,Imp.32Ω,10cm(4"), PM Dynamic	1	OX
SWITCHES				
S1-1~S1-10	RSR6J01Z-H	Switch,Band	1	OX
S2-1,S2-2	RSS69Z-M	Switch,Digital Display	1	OX
S3-1,S3-2	RSS2B03Z-H	Switch,BFO	1	OX
S4-1,S5,S6	RSTX003Y-A	Switch,Band Width,Power,Light	1	OX
S7	RSS2B02Z-H	Switch,Phono/Radio	1	X
S8	RSR2A01Z-H	Switch,Voltage Selector	1	X
RESISTORS				
R113,119,121,123,132	ERD25TJ470	47Ω, ¼Watt, ±5%, Carbon	5	Z
R239,145	ERD25TJ101	100Ω, ¼Watt, ±5%, Carbon	2	Z
R118,147,150	ERD25TJ221	220Ω, ¼Watt, ±5%, Carbon	3	Z
R153	ERD25TJ331	330Ω, ¼Watt, ±5%, Carbon	1	Z
R109,225	ERD25TJ471	470Ω, ¼Watt, ±5%, Carbon	2	Z
R124,208,154	ERD25TJ681	680Ω, ¼Watt, ±5%, Carbon	2	Z
R107,103,104,111,140,240,514	ERD25TJ102	1KΩ, ¼Watt, ±5%, Carbon	9	Z
R131,148,215	ERD25TJ152	1.5KΩ, ¼Watt, ±5%, Carbon	3	Z
R120,128,205,211,932	ERD25TJ222	2.2KΩ, ¼Watt, ±5%, Carbon	5	Z
R149,905	ERD25TJ332	3.3KΩ, ¼Watt, ±5%, Carbon	2	Z
R102,106,110,127,224	ERD25TJ472	4.7KΩ, ¼Watt, ±5%, Carbon	5	Z
R114,126,134,139,231	ERD25TJ103	10KΩ, ¼Watt, ±5%, Carbon	5	Z
R143,221	ERD25TJ333	33KΩ, ¼Watt, ±5%, Carbon	2	Z
R122	ERD25TJ473	47KΩ, ¼Watt, ±5%, Carbon	1	Z
R101,105,112,136,226,228	ERD25TJ104	100KΩ, ¼Watt, ±5%, Carbon	6	Z
R115,117,137,210,237	ERD25TJ224	220KΩ, ¼Watt, ±5%, Carbon	5	Z
R116,212,234	ERD25TJ334	330KΩ, ¼Watt, ±5%, Carbon	3	Z
R1,108,156	ERD25TJ474	470KΩ, ¼Watt, ±5%, Carbon	3	Z
R133	ERD25TJ273	27KΩ, ¼Watt, ±5%, Carbon	1	Z
R146	ERD25TJ220	22KΩ, ¼Watt, ±5%, Carbon	1	Z
R151,909	ERD25TJ122	1.2KΩ, ¼Watt, ±5%, Carbon	2	Z
R130,155	ERD25TJ392	3.9KΩ, ¼Watt, ±5%, Carbon	2	Z
R138,236	ERD25TJ683	68KΩ, ¼Watt, ±5%, Carbon	2	Z
R206,218,220,934	ERD25TJ682	6.8KΩ, ¼Watt, ±5%, Carbon	4	Z
R216,143	ERD25TJ153	15KΩ, ¼Watt, ±5%, Carbon	2	Z
R213,235	ERD25TJ470	47Ω, ¼Watt, ±5%, Carbon	2	Z
R202,229	ERD25TJ333	33KΩ, ¼Watt, ±5%, Carbon	2	Z
R135,234	ERD25TJ154	150KΩ, ¼Watt, ±5%, Carbon	2	Z

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R203	ERD25TJ124	120KΩ, ¼Watt, ±5%, Carbon	1	Z
R910	ERD25TJ100	10Ω, ¼Watt, ±5%, Carbon	1	Z
R214	ERD25TJ471	470Ω, ¼Watt, ±5%, Carbon	1	Z
R125,222	ERD25TJ680	68Ω, ¼Watt, ±5%, Carbon	2	Z
R217	ERD25TJ272	2.7KΩ, ¼Watt, ±5%, Carbon	1	Z
R232	ERX1ANJ1R0	1Ω, 1Watt, ±5%, Metal	1	Z
R907	RRD18XK680	68Ω, ⅛Watt, ±10%, Chip	1	Z
R933	RRD18XK331	330Ω, ⅛Watt, ±10%, Chip	1	Z
R908	RRD18XK681	680Ω, ⅛Watt, ±10%, Chip	1	Z
R917	RRD18XK102	1KΩ, ⅛Watt, ±10%, Chip	1	Z
R903,931	RRD18XK222	2.2KΩ, ⅛Watt, ±10%, Chip	2	Z
R912	RRD18XK682	6.8KΩ, ⅛Watt, ±10%, Chip	1	Z
R902,911,915	RRD18XK103	10KΩ, ⅛Watt, ±10%, Chip	3	Z
R901	RRD18XK223	22KΩ, ⅛Watt, ±10%, Chip	1	Z
R916,918,919 920,921,922 925,926,927 928,929,930 923,924	RRD18XK104	100KΩ, ⅛Watt, ±10%, Chip	14	Z
R914	RRD18XK154	150KΩ, ⅛Watt, ±10%, Chip	1	Z
R904,913	RRD18XK224	220KΩ, ⅛Watt, ±10%, Chip	2	Z
R158	ERD25TJ330	33Ω, ¼Watt, ±5%, Carbon	1	Z
R157	ERD25TJ151	150Ω, ¼Watt, ±5%, Carbon	1	Z
R144	ERD25TJ223	22KΩ, ¼Watt, ±5%, Carbon	1	Z
R241	ERD25TJ123	12KΩ, ¼Watt, ±5%, Carbon	1	Z

CAPACITORS

C104	ECCD1H010C	1PF, 50WV, ±0.25PF, Ceramic	1	Z
C177,118	ECCD1H040C	4PF, 50WV, ±0.25PF, Ceramic	2	Z
C1,113,166, 179	ECCD1H100KC	10PF, 50WV, ±10%, Ceramic	4	Z
C101,111,161 170	ECCD1H120KC	12PF, 50WV, ±10%, Ceramic	4	Z
C163	ECCD1H150KC	15PF, 50WV, ±10%, Ceramic	1	Z
C162	ECCD1H180KC	18PF, 50WV, ±10%, Ceramic	1	Z
C146,502	ECCD1H270KC	27PF, 50WV, ±10%, Ceramic	2	Z
C161,172,511	ECCD1H101K	100PF, 50WV, ±10%, Ceramic	3	Z
C117	ECCD1H1R5C	1.5PF, 50WV, ±0.25PF, Ceramic	1	Z
C517	ECCD1H330KC	33PF, 50WV, ±10%, Ceramic	1	Z
C108	ECCD1H390KC	39PF, 50WV, ±10%, Ceramic	1	Z
C195	ECCD1H330KU	33PF, 50WV, ±10%, Ceramic	1	Z
C196	ECCD1H220KX	22PF, 50WV, ±10%, Ceramic	1	○Z
C197	ECCD1H100KX	10PF, 50WV, ±10%, Ceramic	1	○Z
C124	ECCD1H070DW	7PF, 50WV, ±0.5PF, Ceramic	1	Z
C107,115,116 152,207,326 507	ECKD1H102MD	0.001μF, 50WV, ±20%, Ceramic	8	Z
C109,112,120 128,134,137 154,168,169 174,402,403 404,405,504	ECKD1H103PF	0.01PF, 50WV, ±10%, Ceramic	13	Z
C126,133,173 158,175,180 182,201,205 225,520,521	ECKD1H103MD	0.01μF, 50WV, ±20%, Ceramic	12	Z

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
C139,149,150 185	ECKD1H223PF	0.022μF, 50WV, ±10%, Ceramic	4	Z
C515	ECKD1H102PF	0.002μF, 50WV, ±10%, Ceramic	1	Z
C516	ECKD1H222MD	0.0022μF, 50WV, ±20%, Ceramic	1	Z
C156	ECKD1H153MD	0.015μF, 50WV, ±20%, Ceramic	1	Z
C127,132,141 144,183,184 505,506	ECKD1H223MD	0.022μF, 50WV, ±20%, Ceramic	8	Z
C213	ECKD1H332MD	0.0033μF, 50WV, ±20%, Ceramic	1	Z
C160,220 508	ECFVD333MD	0.033μF, 25WV, ±20%, Semi-Conductor	3	Z
C176	ECFVD473MD	0.047μF, 25WV, ±20%, Semi-Conductor	1	Z
C138,143,211 215	ECFVD683MD	0.068μF, 25WV, ±20%, Semi-Conductor	4	Z
C212,218,232	ECFVD103MD	0.01μF, 25WV, ±20%, Semi-Conductor	3	Z
C217,219,221 931	ECFVD223MD	0.022μF, 25WV, ±20%, Semi-Conductor	4	Z
C153	ECMS05101JH	100PF, 50WV, ±5%, Mica	1	Z
C151,191	ECMS05121JH	120PF, 50WV, ±5%, Mica	2	Z
C192	ECMS05680JH	68PF, 50WV, ±5%, Mica	1	Z
C190	ECQS05361JZ	360PF, 50WV, ±5%, Styrol	1	Z
C129	ECQS05102KZ	1000PF, 50WV, ±10%, Styrol	1	Z
C199	ECQS05182KZ	1800PF, 50WV, ±10%, Styrol	1	Z
C198	ECQS05432JZ	4300PF, 50WV, ±5%, Styrol	1	Z
C145,510	ECQG05683MZ	0.068μF, 50WV, ±20%, Styrol	2	Z
C186,210	ECEA1AS101	100μF, 10WV, Electrolytic	2	Y
C122,927	ECEA1AS470	47μF, 10WV, Electrolytic	2	Y
C142,148,202 203,204,214	ECEA1AS221	220μF, 10WV, Electrolytic	6	Y
C136,910,916	ECEA0JS471	470μF, 6.3WV, Electrolytic	3	Y
C130,135,140 178	ECEA1CS330	33μF, 16WV, Electrolytic	4	Y
C147,167,171 181	ECEA1HS100	10μF, 50WV, Electrolytic	4	Y
C110,905,209	ECEA2AS2R2	2.2μF, 100WV, Electrolytic	3	Y
C216,911	ECEA2AS3R3	3.3μF, 100WV, Electrolytic	2	Y
C206,208,231	ECEA2AS010	1μF, 100WV, Electrolytic	3	Y
C223,401	ECEA1HS102	1000μF, 50WV, Electrolytic	2	Y
C227,930	ECEA1CS100	10μF, 16WV, Electrolytic	2	Y
C907	ECEA0JS102	1000μF, 6.3WV, Electrolytic	1	Y
C925	ECEA1JS4R7	4.7μF, 6.3WV, Electrolytic	1	Y
C917	ECEA1VS330	33μF, 35WV, Electrolytic	1	Y
C920	ECQS05271JZ	270PF, 50WV, ±5%, Styrol	1	Z
C922	ECUX1H330KC	33PF, 50WV, ±10%, Chip	1	Z
C906	ECUX1H680KC	68PF, 50WV, ±10%, Chip	1	Z
C902	ECUX1H101KD	100PF, 50WV, ±10%, Chip	1	Z
C903	ECUX1H102ZF	0.001μF, 50WV, ±20%, Chip	1	Z
C903,908,914	ECUX1H223ZF	0.022μF, 50WV, ±20%, Chip	8	Z
C912,915,918 921,923,924	ECUX1H223MD	0.022μF, 50WV, ±20%, Chip	6	Z
C901,913	ECUX1H333ZF	0.033μF, 50WV, ±20%, Chip	2	Z
C165,522	ECCD1H050CC	5PF, 50WV, ±0.25PF, Ceramic	2	Z
C509,519	ECCD1H470KC	47PF, 50WV, ±10%, Ceramic	2	Z
C164	ECCD1H680K	68PF, 50WV, ±10%, Ceramic	1	Z
C501	ECQS05681JZ	680PF, 50WV, ±5%, Styrol	1	Z
C932,934,933	ECKD1H471KB	470PF, 50WV, ±10%, Ceramic	3	Z
C935	ECFVD104MD	0.1μF, 25WV, ±20%, Semi-Conductor	1	Z

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
C157	ECEA50VR1	0.1μF, 50WV, Electrolytic	1	Z
C188	ECKD1H030C	3PF, 50WV, ±0.25PF, Ceramic	1	Z
CABINET				
CA1	RYMF2800LBSX	Cabinet Assembly	1	OX
CA2	RYFF2800LBSX	Cabinet Cover Assembly	1	OX
CA2	RYFF2800LBSI	Cabinet Cover Assembly, For Italy	1	OX
CA3	RYNF2800M	Battery Cover Assembly	1	OX
CA4	RYT1F2800N	Knob Assembly, Volume	1	OX
CA5	RYT2F2800N	Knob Assembly, Tuning	1	OX
CA6	XEART160GE-Y	Telescopic Antenna, 7 Steps, 960mm	1	OX
	RJF1065Z	Terminal	2	OX
CA7	RJC205B	Terminal, Battery ⊕ Side	2	Y
CA8	RJC111A	Terminal, Battery ⊕ Side	1	Y
CA9	RJC505Z	Terminal Spring, Battery ⊖ Side	1	Y
CA10	RJC508Z	Terminal Spring, Battery ⊖ Side	1	OY
CA11	RJC509Z	Terminal Spring, Battery ⊖ Side	1	OY
CA12	RBN381Z	Knob, Bass, Treble, Pitch and etc.	4	OY
CA13	RBN420Z	Knob, SW Cal.	1	OY
CA14	RBS112Z	Knob, Band	1	OY
CA15	RBE13Y	Knob, Power	1	OY
CA16	RBE13X	Knob, Light, FM AFC	2	OY
	RHG316A	Foot, Cabinet	2	Z
	RHG886Y	Rubber, Speaker	1	OZ
CA17	XTN3+25C	Screw, Cabinet Cover M'tg	6	Z
CHASSIS				
CH1	RSG8ZS	Dial Mechanism Assembly	1	OX
CH2	RYDF2800LBSX	Dial Scale Assembly	1	OX
CH3	RXEF2800M	Dial Scale Chassis Assembly	1	OX
CH4	XBA2C08TRO	Fuse, 250V, 800mA	1	X
	RAD5-BT-11	Frequency Display	1	OX
CH5	XAMR43S100A	Pilot Lamp, 9V, 60mA	1	X
CH6	RSM2616Z-K	Meter, Tune/Battery	1	OX
CH7	RJJ115Z-H	Jack, AC IN	1	Y
CH8	RJF7A	Holder, Fuse	2	Z
	RJS31-1	Socket, Din	1	Y
	RUS323Z	Spring, Dial Gear	1	OZ
	RUS295Z	Spring, Dial Drum	1	OZ
CH9	RUV426Z	Cover, Voltage Selector	1	Z
CH10	RUV482Z	Cover, AC IN Jack	1	OZ
CH11	RDG5656Z	Gear, Dial	1	OZ
CH12	RDG5658Z	Gear, Dial Scale	1	OZ
CH13	RJS219Y-X	Socket (7P), PC Board	1	Z
CH14	RJS112Y-X	Socket (6P), PC Board	1	Z
CH15	RJS217Y-X	Socket (5P), PC Board	2	Z
CH16	RJS216Y-X	Socket (4P), PC Board	1	Z
CH17	RJS253Y-X	Socket (3P), PC Board	1	Z
	RJP119Z	Plug (7P), Socket	1	Z
	RJP142Z	Plug (6P), Socket	1	Z
	RJP116Z	Plug (5P), Socket	2	Z
	RJP109Z	Plug (4P), Socket	1	Z
	RJP137Z	Plug (3P), Socket	1	Z
CH18	RDV2Z	Belt, Dial	1	OY
	XYNR26+C6	Screw, Dial Gear M'tg	2	Z
	XXAR3H6S	Screw, Dial Scale M'tg	2	OZ

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
CH19	XUC2FY	Circrip, Shaft for Band Switch	1	Z
	XUC6FY	Circrip, Dial Scale Gear M'tg	1	Z
	XNS8	Nut, Bass, Treble and etc. M'tg	6	Z
	XWS8AW	Washer, Bass, Treble and etc. Mtg	6	Z
	RJJ62B	Jack, EXT.SP., MPX OUT, REC OUT	3	Y
ACCESSORIES				
	XEH1A1-P	Magnetic Earphone	1	Y
	RJA20Z-K	Power Cord, AC	1	Y
	RKE234Z	Hood, Dial	1	OY
	RQC9013Z	Belt, Cabinet	1	OY
PACKING MATERIALS				
	RPP214Z	Polyethylene Cover	1	Z
	RPN9227Z	Pad Complete	1	OZ
	(Not Available, Order	Pad, Left Side	(1)	
	RPN9227Z	Pad, Right Side	(1)	
	RPN2567Z	Pad, Both Side	2	OZ
	RPK590Z	Gift Box	1	OZ
	RPK590Y	Gift Box, For Italy	1	OZ
	RQX6198Z	Instruction Book	1	OY

CHASSIS PARTS LOCATIONS

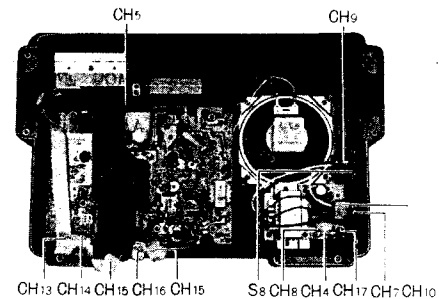


Fig. 30

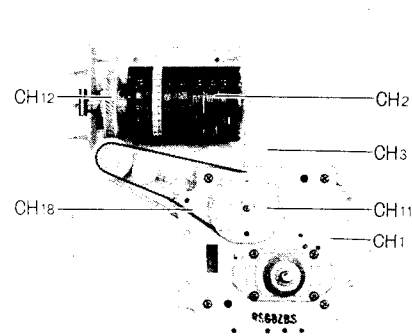


Fig. 31

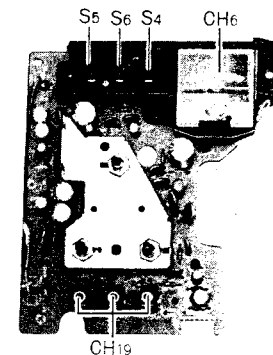


Fig. 32